

**STATE OF ILLINOIS
ILLINOIS COMMERCE COMMISSION**

**ILLINOIS COMMERCE COMMISSION)
On Its Own Motion)**

**Proposed Establishment Of)
Collocation Tariffs For GTE North)
Incorporated And GTE South Incorporated)**

Docket Nos. 00-0511/0512

**TESTIMONY OF
LARRY RICHTER
ON BEHALF OF**

**VERIZON NORTH INC.
VERIZON SOUTH INC.
(Formerly GTE North Incorporated and GTE South Incorporated)**

SEPTEMBER 21, 2000

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I. INTRODUCTION

Q. PLEASE STATE YOUR NAME AND BUSINESS ADDRESS.

A. My name is Larry Richter my business address is 600 Hidden Ridge, Irving, Texas 75038. I am employed by Verizon Communications in the job title of Consultant – Service Cost. In this proceeding, I am representing Verizon North Inc. ("Verizon" or the "Company"), which was formerly known as GTE North Incorporated, and Verizon South ("Verizon" or the "Company") which was formerly known as GTE South Incorporated. While I refer to the Verizon cost study in my testimony, it should be noted that the cost studies and inputs provided in this docket have been developed by and for the former GTE telephone operating companies and reflect those companies' operations, practices and procedures.

Q. WHAT IS YOUR EDUCATIONAL BACKGROUND AND EXPERIENCE IN TELECOMMUNICATIONS?

A. I have a Bachelors Degree in Business Administration from Northwood University.

I have been employed by Verizon for over 31 years. Upon joining GTE, I held craft positions in Outside Plant in California for five years. I was then promoted to management, where I have been primarily associated with Network Operations in varying capacities, each with increasing responsibilities. These included Service and Facilities Management and Outside Plant Maintenance responsibilities for various exchanges in Texas. I held Administrative Support and Budget Analyst positions for Engineering and

1 Construction for Outside Plant, Central Office, and Installation and Maintenance. In this
2 capacity, I was responsible for budget creation, tracking and results information for the
3 department. I also held the position of Business Analyst for Capital and Expense budget
4 creation and tracking for Engineering and Construction units for the Texas/New Mexico
5 Region. I have held manager positions for Installation and Maintenance Departments and
6 Service Centers responsible for Dispatch, Assignment, Repair Answer, and Test Center.
7 In my current capacity I have responsibility for gathering and processing the data for the
8 inputs to the Expanded Interconnection Services Collocation Cost Study ("EIS Study").
9

10 **Q. HAVE YOU TESTIFIED PREVIOUSLY BEFORE PUBLIC UTILITIES**
11 **COMMISSIONS ON VERIZON'S COLLOCATION COSTS?**

12 A. Yes. I have testified before the California Public Utilities Commission and the
13 Washington Utilities and Transportation Commission. I have submitted testimony to the
14 Michigan Public Service Commission and the Hawaii Public Utilities Commission on the
15 costs that Verizon incurs to provide collocation service.
16

17 **Q. PLEASE STATE THE PURPOSE OF YOUR TESTIMONY.**

18 A. My testimony, together with Verizon witness Barbara Ellis' testimony, addresses the
19 Verizon EIS collocation cost study for Illinois. My testimony explains the cost elements
20 and composition of the EIS study. I am also responsible for the preparation of the inputs
21 and technical aspects of the cost study.
22

1 **Q. ARE THERE ANY ATTACHMENTS TO YOUR TESTIMONY?**

2 **A. Yes, the EIS Collocation Cost Study for the state of Illinois is attached and is identified**
3 **as Attachment LR-1. Verizon requests that it be afforded proprietary treatment.**

4
5 **Q. FOR WHAT TYPES OF COLLOCATION DOES THE EIS STUDY PROVIDE**
6 **COSTS?**

7 **A. The EIS Study provides costs for all elements for the following forms of collocation:**

8 Single Cage

9 Shared Cage

10 Subleased Cage

11 Cageless

12 Adjacent On-Site

13 Verizon witnesses Barbara Ellis and David Horton provide detailed descriptions of each
14 *form of collocation.*

15
16 **Q. HOW ARE THE COLLOCATION COSTS ORGANIZED IN THE EIS STUDY?**

17 **A. Collocation costs are divided into two groups in the EIS Study: Those that will be**
18 **recovered through non-recurring charges and those that will be recovered through**
19 **monthly recurring charges.¹ I explain the functions and costs associated with each below.**

20

¹Although the EIS Study refers generally to recurring and non-recurring as categories of costs, not charges, the classification of these costs as recurring and non-recurring was done based on the method of cost recovery, rather than on the basis of cost characteristics. For example, there are costs included in the EIS Study as monthly recurring, although their cost characteristics suggest a non-recurring cost. This classification was done for ease of the reader in reviewing the EIS Study and accompanying testimony.

1 **II. COSTS FOR NON-RECURRING CHARGES**

2
3 **Q. WHAT TYPES OF NON-RECURRING CHARGE ACTIVITIES ARE**
4 **PERFORMED TO PROVIDE COLLOCATION.**

5 A. Verizon will perform the following non-recurring charge activities, and incur the
6 associated costs, to provide collocation: Engineering, Building Modification, DC Power
7 Facility, Fiber Cable Pull, Metallic Cable Pull, Cable Fire Retardant, Cable Splice,
8 Facility Pull, Relay Rack, Telecommunications Equipment Cabinet, Building Integrated
9 Timing Supply (BITS), Premise Space Report, Fiber Optic Cross Connect, and Cable
10 Material. I explain each of these below.

11
12 **Engineering**

13 **Q. WHAT ENGINEERING COSTS DOES VERIZON INCUR TO PROVIDE**
14 **COLLOCATION?**

15 A. Verizon incurs costs to plan and engineer how to accommodate a Competitive Local
16 Exchange Carriers' (CLEC) request for collocation space within a central office. Verizon
17 personnel, including the Central Office Equipment Engineer, Land & Buildings Engineer,
18 and the Outside Plant Engineer, meet at the central office to identify those arrangements
19 that are necessary to provide collocation as requested by a CLEC. As part of this process,
20 the future use of space within the central office is evaluated to determine the best location
21 for the collocation area. Once the planning phase is complete, there is also the activity
22 element in which the engineers work on the actual provisioning of space to accommodate

1 the collocation request. Status meetings are held throughout the engineering process to
2 discuss the progress of the collocation activity.

3
4 **Q. WHAT OTHER ENGINEERING ACTIVITIES MAY BE NECESSARY TO**
5 **ACCOMMODATE COLLOCATION REQUESTS?**

6 A. Depending on the collocation activity, it may be necessary to utilize contract building
7 design engineers or architects to complete the activity. For example, contract building
8 design engineers or architects would be responsible for drawing the blueprints that will
9 be used by a general contractor to perform the necessary work.

10
11 **Q. WHERE ARE THE PLANNING AND ENGINEERING COSTS DEVELOPED IN**
12 **THE STUDY?**

13 A. The Engineering costs are detailed on pages 1 - 2 of Section 6 of the EIS Study.

14
15 **Building Modification**

16 **Q. WHAT ARE BUILDING MODIFICATION COSTS?**

17 A. Building Modification costs include all costs associated with modifying the central office
18 to accommodate a collocator. Due to the variability between central office collocation
19 projects, there are several Building Modification cost elements presented in the EIS
20 Study. The following cost elements are classified as Building Modification activities and
21 costs:

22 Access Card Administration

23 Cage Grounding Bar

1 Overhead Superstructure

2 Cage Enclosure

3 Cage Gate

4

5 The Building Modification activities and costs are detailed on pages 3 - 8 of Section 6 of
6 the EIS Study.

7

8 **Q. PLEASE EXPLAIN THE ACTIVITIES AND COSTS ASSOCIATED WITH**
9 **ACCESS CARD ADMINISTRATION.**

10 **A.** The Access Card Administration function is the work time necessary for the Security
11 group to process the request for access cards in order to activate the card reader at the
12 particular central office for which the collocater seeks access. Activities within this
13 function range from card ordering, card activation, card reader activation, distribution of
14 cards to the collocater, and maintenance of the records on cardholders.

15

16 Access Card Administration costs were developed in the EIS Study by the Verizon
17 Security personnel who actually prepare the cards and program the card reader/controller
18 for activation. The listing of the individual activities within this function, with associated
19 time intervals, are provided on page 3 of Section 6 of the EIS Study.

20

1 **Q. PLEASE EXPLAIN THE ACTIVITIES AND COSTS ASSOCIATED WITH THE**
2 **CAGE GROUNDING BAR ELEMENT.**

3 A. The Cage Grounding Bar element addresses the functions and costs associated with
4 placing a cage ground bar in the collocation cage. The cage ground bar will be used by
5 the collocator to ground its equipment. A ground cable will be placed from the cage
6 ground bar to the floor ground bar, which is connected to the central office network
7 ground. The costs of providing the cage ground bar, including labor and material, are
8 detailed on page 4 of Section 6 of the EIS Study.

9
10 **Q. PLEASE EXPLAIN THE ACTIVITIES AND COSTS ASSOCIATED WITH THE**
11 **OVERHEAD SUPERSTRUCTURE FUNCTION.**

12 A. The Overhead Superstructure activity captures the costs associated with placing cable
13 racking from the existing racking to the collocator's area. The elements necessary to
14 accomplish this activity are engineering, installation labor, travel time, and materials.
15 This cable racking is dedicated to the individual collocator and joins up with the existing
16 cable racking in the central office. The costs of providing the overhead superstructure are
17 detailed on page 5 - 6 of Section 6 of the EIS Study.

18
19 **Q. PLEASE EXPLAIN THE ACTIVITIES AND COSTS ASSOCIATED WITH THE**
20 **CAGE ENCLOSURE AND CAGE GATE BUILDING MODIFICATIONS.**

21 A. These two elements are necessary to build a collocator's cage. The Cage Enclosure
22 includes the cost of fencing, poles, and the miscellaneous items necessary to build the
23 cage. The Cage Gate provides access and security for the collocator's equipment within

1 the cage. The fencing and associated material in the EIS Cost Study for these two
2 elements is based on a cost per square foot of fencing material developed on pages 7 - 8
3 of Section 6 of the EIS Study.

4
5 **DC Power Facility**

6 **Q. PLEASE EXPLAIN THE ACTIVITIES AND COSTS ASSOCIATED WITH THE**
7 **DC POWER FACILITY.**

8 A. The DC Power Facility is the installation cost of the power cables that are run from the
9 Battery Distribution Fuse Bay (BDFB) to the collocator's individual location. The size of
10 these cables will be engineered in accordance with the requested amps, the voltage drop,
11 and the distance to the collocator's area. These required cables can be provided by the
12 collocator or they can be purchased from Verizon. The cost of installing the required
13 power cables is based on the labor rate for a Central Office Equipment ("COE") Installer
14 in Illinois and the hours-per-unit to perform this activity. The DC Power Facility costs
15 are detailed on page 9 of Section 6 of the EIS Study.

16
17 **Fiber Cable Pull**

18 **Q. PLEASE EXPLAIN THE ACTIVITIES AND COSTS ASSOCIATED WITH THE**
19 **FIBER CABLE PULL.**

20 A. The Fiber Cable Pull is the placement of fiber cable for the collocator from the first
21 manhole outside the cable vault through the conduit system and cable vault to the
22 collocators' equipment inside the central office. First, an Outside Plant Engineer must
23 visit the location and determine the subduct assignment from the manhole to the cable

1 vault. The actual installation activity includes time to set up at the manhole and cable
2 vault, to prepare for the cable pull, and the actual pulling of the cable. Innerduct is also
3 placed from the cable vault to the collocater's equipment location and the fiber cable is
4 placed inside the innerduct.

5
6 The work times for pulling cable are based on specific data in Verizon's Illinois Single
7 Source Provider (SSP) contractor bidding system. The cost for this function is provided
8 on page 10 of Section 6 of the EIS Study.

9
10 **Q. WHAT IS VERIZON'S ILLINOIS SINGLE SOURCE PROVIDER ("SSP")**
11 **CONTRACTOR BIDDING SYSTEM?**

12 **A.** The Illinois SSP is a competitive bidding system that Verizon uses to establish unit rates
13 for specific outside plant construction activities. Separate bids are taken from contractors
14 for different geographical zones within Illinois. Verizon asks for bids on these activities
15 from local Illinois companies who meet Verizon's quality and insurance requirements. A
16 weighted average of the bids submitted by these local companies is used to develop the
17 cost in Verizon's cost study for each outside plant construction function or activity used
18 in collocation.

19

1 **Metallic Cable Pull**

2 **Q. PLEASE EXPLAIN THE ACTIVITIES AND COSTS ASSOCIATED WITH THE**
3 **METALLIC CABLE PULL.**

4 A. The Metallic Cable Pull is similar to the Fiber Pull in that an Outside Plant Engineer must
5 visit the cable vault and manhole to determine the cable duct to use. The pulling crew
6 must then set up equipment at the manhole and cable vault in order to pull the cable. The
7 pull rate is based on Illinois-specific SSP rates for the size of cable being pulled. The
8 cost for this function is provided on page 11 of Section 6 of the EIS Study.

9
10 **Cable Fire Retardant**

11 **Q. PLEASE EXPLAIN THE ACTIVITIES AND COSTS ASSOCIATED WITH THE**
12 **CABLE FIRE RETARDANT.**

13 A. The Cable Fire Retardant activity is associated with filling the space around cables
14 extending through walls or floors with a non-flammable material to prevent fire from
15 spreading from one room or floor to another. This activity is performed when either DC
16 power cable or transmission cable is run between floors or through a wall. Fire retardant
17 material is removed from the hole to place cable and must be replaced after the cable is
18 placed. COE Installers who perform this work estimate the average time to perform this
19 activity to be one hour.

1 **Cable Splice**

2 **Q. PLEASE EXPLAIN THE ACTIVITIES AND COSTS ASSOCIATED WITH THE**
3 **CABLE SPLICE.**

4 A. A Cable Splice can be made on either fiber or metallic cable. The splicing function
5 includes drafting a work order and determining where the splicing operation will be
6 completed. The rates to splice these cables are based on the SSP rates. The cost for this
7 function is provided on page 12 of Section 6 of the EIS Study.

8
9 **Facility Pull**

10 **Q. PLEASE EXPLAIN THE ACTIVITIES AND COSTS ASSOCIATED WITH THE**
11 **FACILITY PULL.**

12 A. A Facility Pull is the placing of transmission cable inside the central office. This includes
13 an engineering cost to complete the work order and determining how the cables will be
14 run within the central office. Facility pull costs are developed for DS0 cable based on 100
15 pair, for DS1 cable consisting of 28 pair for transmit and 28 pair for receive, and for DS3
16 coaxial cable consisting of one transmit and one receive coaxial cable. One hour of travel
17 time will be included in the cost for the Central Office Installer to drive to the central
18 office to perform the activities. The cost for this function is provided on pages 13 - 15 in
19 Section 6 of the EIS Study.

1 **Relay Rack and Telecommunications Equipment Cabinet**

2 **Q. PLEASE EXPLAIN THE ACTIVITIES AND COSTS ASSOCIATED WITH THE**
3 **RELAY RACK AND THE TELECOMMUNICATIONS EQUIPMENT CABINET.**

4 **A.** The collocator has the option to place a relay rack or cabinet in its leased collocation
5 space. Both types of equipment are secured to the floor and/or the overhead
6 superstructure. Verizon has developed material costs for the rack and cabinet, as well as
7 cost for engineering and installation of both in the event the collocator elects that Verizon
8 provide and install the rack or cabinet. The rack costs include the material cost provided
9 in Verizon's Advanced Materials System (GTEAMS), and the hours per unit necessary
10 for installation. The cabinet costs include the material cost of a cabinet that Verizon
11 currently uses, and the installation is based on the Company's experience of the time
12 required to install the cabinet. Cabinet installation requires two technicians. The costs
13 for these functions are provided on pages 16 - 19 of Section 6 of the EIS Study.

14
15 **Q. WHAT IS GTEAMS?**

16 **A.** GTEAMS is a material management system utilized by Verizon to perform inventory
17 planning and accounting, and purchasing and material management functions for its
18 operating companies. It includes two forms of the current costs for materials used by
19 Verizon's operating companies: (1) the actual costs paid for materials that are in
20 inventory and (2) current and effective price quotes for materials that may not be in
21 inventory. Verizon's EIS Study utilizes costs from GTEAMS for materials used in
22 collocation.

Building Integrated Timing Supply (BITS)

Q. PLEASE EXPLAIN THE ACTIVITIES AND COSTS ASSOCIATED WITH BITS.

A. BITS is the central office timing system that provides a common source for the frequency and phase synchronization necessary for any digital transmission network. BITS clocks are devices used to provide timing and synchronization information to the equipment elements of a digital transmission system or network. A collocator, at its option, may purchase BITS services from Verizon.

The cost is associated with the installation of a shielded cable, based on hours per unit (HPUs) of a COE Installer, from the port card access to the collocator's equipment. The material cost is based on GTEAMS cost for the shielded cable. The engineering time is based on the Company's experience to engineer a port for BITS timing. The costs for these functions are provided on pages 13 - 15 of Section 6 of the EIS Study.

Premise Space Report

Q. PLEASE EXPLAIN THE ACTIVITIES AND COSTS ASSOCIATED WITH THE PREMISE SPACE REPORT.

A. The Premise Space Report indicates available space and is provided upon request. Its costs are associated with engineers visiting the central office and evaluating the available collocation space. The costs for these functions are provided on page 20 of Section 6 of the EIS Study.

1 **Fiber Optic Cross Connect**

2 **Q. PLEASE EXPLAIN THE COSTS ASSOCIATED WITH THE FIBER OPTIC**
3 **CROSS CONNECT.**

4 **A.** The fiber optic cross connect reflects the costs incurred to place a fiber optic patch cord
5 from the collocators' equipment location to the fiber distribution panel. This cost is
6 based on the HPU and Illinois labor rate of a COE Installer for a facility pull. The costs
7 for the fiber optic cross connect are provided on pages 22 – 23 of Section 6 of the EIS
8 Study.

9
10 **Cable Material**

11 **Q. PLEASE EXPLAIN THE COSTS ASSOCIATED WITH CABLE MATERIAL.**

12 **A.** Verizon will sell transmission cables to CLEC's upon request. The costs for these cables
13 are based on GTEAMS. The costs for the cables are provided on page 21 of Section 6 of
14 the EIS Study.

15
16 **III. COSTS FOR MONTHLY RECURRING CHARGES**

17
18 **Q. WHAT ARE THE ELEMENTS FOR WHICH VERIZON PROPOSES**
19 **RECOVERY THROUGH MONTHLY RECURRING CHARGES THAT ARE**
20 **INCURRED TO PROVIDE COLLOCATION?**

21 **A.** The following elements will be recovered through monthly recurring charges: Floor
22 Space, Floor Space for Relay Racks and Cabinets, Cable Space, DC Power Facility, DC

1 Power Utility, Facility Termination, Building Modification, Cable Vault Splice, Cable
2 Vault Utilization, Cable Rack Utilization, Fiber Optic Cross Connect, and BITS.

3
4 **Floor Space**

5 **Q. WHAT ARE FLOOR SPACE COSTS?**

6 A. Floor Space costs are those costs to provide environmentally conditioned floor space to
7 the collocator, based on an average cost per square foot, plus costs to account for shared
8 floor space. Floor space costs were determined by examining the building investment
9 amounts, square footage, and monthly maintenance/utility expenses developed from
10 central offices in Illinois to calculate the average cost per square foot in the EIS Study.
11 The floor space cost calculations may be found on pages 26 – 28 in Section 6 of the EIS
12 Study.

13
14 **Q. HOW DID VERIZON DETERMINE THE BUILDING INVESTMENT COSTS?**

15 A. Verizon examined those central offices in Illinois that met the following criteria: those
16 that serve more than 5,000 lines, are base unit switching central offices, are wire centers,
17 and were built after 1945. Verizon used index factors from RS Means, an industry
18 publication on building construction cost data,² to bring the original building investments
19 and subsequent investments in the building to a present value, and then divided the
20 present value by the total square footage of the building to determine the cost per square
21 foot.

22

²RS Means, "Building Construction Cost Data 55 Annual Edition 1997."

1 Q. HOW WAS THE BUILDING HEATING, VENTILATION, AIR CONDITIONING
2 (HVAC) INVESTMENT DETERMINED?

3 A. In order to determine the HVAC associated with the building versus the HVAC
4 associated with cooling equipment (Environmental Conditioning Costs) the following
5 method was used. The HVAC investment contained in the building cost was calculated
6 and adjusted based on criteria identified in RS Means. This calculation was determined
7 by: (1) removing the average building investment for HVAC, 16%, from the total value
8 of the building; (2) determining the amount of HVAC investment necessary to cool the
9 square footage of the building, excluding any equipment, based on a factor of 432 square
10 feet of building space requiring one ton of HVAC, which was calculated from Verizon
11 central offices; and (3) then adding back the adjusted amount for building HVAC to the
12 building investment.

13
14 Q. HOW WAS LAND INVESTMENT DETERMINED?

15 A. Using the same central offices as in the building investment calculation, original land
16 costs were gathered to add to the per square foot building values. The original
17 investment values were used because there is no land index to calculate a present value.

18
19 Q. HOW DID VERIZON DERIVE MONTHLY MAINTENANCE AND UTILITY
20 EXPENSES?

21 A. The monthly maintenance and utility expenses for each central office in the study were
22 taken from actual year-end 1998 expense reports, and added to the building investment
23 costs.

1 **Q. HOW DID VERIZON DERIVE SHARED BUILDING COSTS?**

2 A. Verizon used sixteen central offices from multiple states to determine the average amount
3 of shared footage within a central office. Shared space includes building areas that all
4 parties will use in their daily business operations, including hallways, restrooms,
5 breakrooms, and, in some cases, staging areas.

6
7 To estimate the size of the hallway area, Verizon calculated the square root of the square
8 footage of the buildings to obtain an estimated walking length, and then multiplied this
9 figure by 3 to account for a 3-foot hallway.

10 To estimate the size of the restrooms, staging areas, and breakrooms, Verizon examined
11 actual building prints and measurements for the central offices being studied and derived
12 an average amount of floor space size for each area.

13
14 **Floor Space for Relay Racks and Cabinets**

15 **Q. WHAT DOES THE COST FOR FLOOR SPACE FOR RELAY RACKS AND**
16 **CABINETS REPRESENT?**

17 A. Cageless collocators will use floor space for the placement of a relay rack or a cabinet to
18 house their telecommunications equipment. The floor space necessary for a relay rack
19 was determined by using a linear foot method based on the size of a standard relay rack
20 (24-15/16 inches wide), guard rails (15 inches in length), and the space in front of and
21 behind the rack to permit access to equipment in the rack (18 inches).³ The floor space
22 necessary for the cabinet was based on the dimensions of a standard cabinet used by

³This represents half of the size of a 36-inch aisle because the equipment may be accessed by both sides of the aisle.

1 Verizon (29 x 33 inches), and the space in front of and behind the cabinet to permit
2 access to the cabinet (18 inches). The calculations of the floor space necessary for relay
3 racks and cabinets are provided at pages 24 - 25 of Section 6 of the EIS Study.
4

5 **Cable Space**

6 **Q. WHAT DOES THE CABLE SPACE COST REPRESENT?**

7 A. Cable Space is the part of the conduit system occupied by the CLEC entrance cable. The
8 conduit system includes the manhole, and the conduit and/or the subduct from the
9 manhole to the cable vault.
10

11 **Q. HOW WAS THE CABLE SPACE COST CALCULATED?**

12 A. The overall cost per linear foot was determined by calculating the material and labor
13 costs of installing the manhole and conduit material. All material costs were obtained
14 from GTEAMS and all Verizon labor costs were calculated using Verizon Illinois labor
15 rates. For activities to be completed by vendors, costs were taken from SSP rates. In
16 calculating these costs, Verizon assumed that the conduit system has 32 conduits and that
17 each conduit has three subducts. The calculation of the cable space cost is located on
18 pages 29 - 31 of Section 6 of the EIS Study.
19

1 **DC Power Facility**

2 **Q. WHAT ARE THE COSTS ASSOCIATED WITH THE DC POWER FACILITY**
3 **ELEMENT?**

4 A. The DC Power Facility element is comprised of material and labor costs incurred to
5 provide DC power to the collocator's area. For example, Verizon incurs power plant
6 costs that are necessary to serve the collocator, including such materials as batteries,
7 rectifiers, main fuse panels, and electrical connections to the main power source. Costs
8 also will be incurred to extend power from the power plant to the collocator's area
9 BDFB, including material and labor costs for the associated power cable, fuse panels,
10 relay racks, and distribution bays.

11
12 **Q. HOW WERE THE DC POWER FACILITY COSTS CALCULATED?**

13 A. The power plant cost to provide DC power for a central office was calculated using
14 central office switch requirements based on the line size of the central office. This
15 method used the manufacturers' estimate for power plant equipment, Verizon
16 engineering and installation hours, and the Verizon Illinois labor rate. Power cable costs
17 per amp were based on: the cost from GTEAMS for 750 MCM flexible power cable; the
18 hours per unit to pull the cable, an estimated cable length of 125 feet, the labor rate of a
19 COE Installer, and the material cost and installation of a connector tap on each end for
20 termination.

21
22 The per amp cost of the BDFB was based on a RELTEC model 1293B2 equipped for 600
23 amps, with an engineering capacity of 80% (480 amps), and costs for the relay rack,

1 common equipment, metering panels, and fuse panels. The hours to engineer and install
2 the BDFB are based on the experience of engineers and field forces and using their labor
3 rates to calculate the labor cost. —
4

5 Material loadings are applied to the cost of the power cable and BDFB. The development
6 of DC Power Facility costs is shown on pages 32 – 37 in Section 6 of the EIS Study.
7

8 **Q. WHAT ARE MATERIAL LOADINGS?**

9 A. Material loadings are those costs associated with freight, sales tax, supply provisioning,
10 and minor material costs associated with the installation of telecommunications
11 equipment.
12

13 **DC Power Utility**

14 **Q. WHAT IS DC POWER UTILITY COSTS AND HOW WAS IT CALCULATED?**

15 A. DC Power Utility cost is the monthly electricity expense incurred to service the
16 collocater's power requirements. The amount of commercial electricity necessary to
17 power termination equipment was determined by examining the amount of electricity
18 consumed in Verizon buildings located in Illinois. Verizon power engineers used a
19 Lorain model V200D50 Rectifier to determine the efficiency and heat loss factor that will
20 be incurred to provide the necessary amount of power. The development of DC Power
21 Utility costs is shown on pages 38 - 39 in Section 6 of the EIS Study.
22

1 **Facility Termination**

2 **Q. WHAT ARE FACILITY TERMINATION COSTS?**

3 A. Facility Termination costs are the labor and material costs incurred for facility
4 termination of DS-O, DS-1, and DS-3 circuits. A separate cost is developed for each.
5 The facility termination cost for a DS-O circuit is a 100 pair termination block mounted
6 on a Main Distribution Frame (MDF). DS-1 termination cost is a 56-circuit panel located
7 in a relay rack with other transport-type equipment. The DS-3 panel cost is a 20 module
8 chassis, with individual modules per DS-3.

9
10 **Q. HOW WERE THE FACILITY TERMINATION COSTS DERIVED?**

11 A. For each of the three types of facility terminations, material, including the cost of the
12 cross connect panels, termination blocks, and labor costs were calculated using data from
13 GTEAMS and the COE Installer's HPU. A space occupancy cost of the blocks and
14 panels was also determined for each type of Facility Termination. Space occupancy for
15 DS-O circuit includes the cost of the MDF frame space that the block occupies, and the
16 DS-1 and DS-3 panel cost includes the relay rack and floor space the rack occupies. The
17 cost development for these three types of Facility Termination may be found on pages 41
18 – 46 of Section 6 of the EIS Study.

Building Modification

Q. WHAT BUILDING MODIFICATION COSTS DOES VERIZON PROPOSE TO RECOVER ON A MONTHLY RECURRING BASIS?

A. Verizon proposes to recover the following Building Modification costs on a recurring basis: Storage Security, Card Reader, Demolition and Site Work, Dust Partition, HVAC – Minor, Environmental Conditioning and Electrical Building Modification.

Q. WHAT IS THE STORAGE SECURITY COST?

A. The Storage Security cost is the cost incurred to modify existing cabinets to allow them to be locked. The development of this cost was based on estimates from contractors who perform this type of activity, based on Verizon's assumption that twenty cabinets need to be locked in each central office. The estimates include the installation of a lockable hasp on the cabinet, and the cost of the lock. The calculation of this cost is provided on page 47 of Section 6 of the EIS Study.

Q. WHAT IS THE CARD READER AND WHAT ARE ITS ASSOCIATED COSTS?

A. A Card Reader/Controller may be necessary to provide collocators with secured access to a central office. The cost of the Card Reader is based on installation costs incurred by Verizon in Texas and California, adjusted to reflect Illinois-specific costs using factors provided by the National Construction Estimator. This is an industry-accepted manual used by building engineers and contractors to estimate costs, labor and material, on a state or city basis. The calculation of this cost is provided on page 48 of Section 6 of the EIS Study.

1 Q. WHAT ARE THE ACTIVITIES AND COSTS ASSOCIATED WITH
2 DEMOLITION AND SITE WORK?

3 A. Demolition and Site Work activities are necessary to prepare an area within a central
4 office for collocation, causing Verizon to incur costs to remodel, repair and rehabilitate
5 the central office. These costs are based on actual collocation occurrences in Texas and
6 California adjusted to a National Average and then to an Illinois-specific cost. The
7 calculation of this cost is provided on page 49 of Section 6 of the EIS Study.
8

9 Q. WHAT ARE THE ACTIVITIES AND COSTS ASSOCIATED WITH THE DUST
10 PARTITION?

11 A. A Dust Partition, usually plastic, is placed around a construction area to prevent dust and
12 other foreign matters from being picked up through the central air conditioning system
13 and distributed through the central office to other telecommunications equipment in the
14 central office. This cost is based on actual occurrences in Texas and California in the
15 collocation process, adjusted to reflect Illinois-specific costs. The calculation of this cost
16 is provided on page 49 of Section 6 of the EIS Study.
17

18 Q. WHAT ARE THE ACTIVITIES AND COSTS ASSOCIATED WITH HVAC -
19 MINOR?

20 A. HVAC - Minor is the minor work that may be necessary to relocate or place air
21 conditioning ducts to serve a particular collocation area. Ductwork is necessary to ensure
22 that cooling is provided to the area in which the heat-producing telecommunications
23 equipment collocated by a CLEC is located. These costs are based on actual occurrences

1 in Texas and California during provisioning for collocation, adjusted to reflect Illinois-
2 specific costs. The calculation of this cost is provided on page 49 of Section 6 of the EIS
3 Study.
4

5 **Q. WHAT ARE THE ENVIRONMENTAL CONDITIONING COSTS?**

6 A. The Environmental Conditioning costs are those costs incurred to provide air
7 conditioning treatment for the heat dissipated by the collocator's electronic
8 telecommunications equipment. The calculation used to develop the cost of air
9 conditioning per DC amp is an accepted industry-wide formula and is applied based on
10 the amount of DC power (amps) requested by the collocator. A collocation area of four
11 collocators each occupying a 100 square foot cage and each requesting 80 amps was used
12 to establish the average size of the air conditioning system required to condition the
13 described collocation area. The cost of the air conditioning system was determined by
14 using 1997 RS Means data. The calculation of the environmental conditioning costs is
15 provided on pages 50 - 53 of Section 6 of the EIS Study.
16

17 **Q. WHAT ARE THE ELECTRICAL BUILDING MODIFICATION COSTS?**

18 A. Electrical Building Modification costs include cost for lighting, an electrical outlet and a
19 floor-grounding bar. The lighting costs are those incurred to install a two-bulb
20 fluorescent lamp in the collocation cage or in the relay rack area. Verizon also will incur
21 costs to place an electrical outlet within a collocator's cage or relay rack area for use in
22 operating electrical devices for installing and maintaining equipment. A floor ground
23 bar tied to the main central office ground is provided in the collocation area, causing

Verizon to incur the cost of the floor ground bar, ground cable in the conduit, connection taps, and the labor incurred to place these items. The development of each of these electrical costs is based on the material cost taken from the National Construction Estimator and is provided on pages 54 - 59 of Section 6 of the EIS Study.

Cable Vault Splice

Q. WHAT ARE THE ACTIVITIES AND COSTS ASSOCIATED WITH THE CABLE VAULT SPLICE?

A. The costs presented are for either a fiber or metallic cable splice. The Cable Vault Splice contains the cost of the splice closure material used to enclose the splice. For a metallic cable splice Verizon also incurs engineering and installation labor for placing the MDF where the cable protection devices for metallic cable will be placed. Material costs are taken from GTEAMS, materials loadings are added, and labor rates are applied. Cable Vault Splice costs are provided on pages 60 - 64 of Section 6 of the EIS Study.

Q. ARE THERE OTHER COSTS SPECIFIC TO THE SPLICING OF METALLIC CABLE?

A. Yes. Splicing of metallic cable also requires that protectors be placed on the MDF to ensure that stray voltage does not enter the central office through the metallic cable. These protectors consist of the base unit, module protector units and 100 feet of "stub" cable that will be run to the cable vault where the splice will be made. Cable Vault Splice costs are provided on pages 60 - 64 of Section 6 of the EIS Study.

1 **Cable Vault Utilization**

2 **Q. WHAT ARE THE ACTIVITIES AND COSTS ASSOCIATED WITH THE**
3 **COLLOCATOR'S USE OF THE CABLE VAULT?**

4 **A.** The Cable Vault Utilization is the area within the cable vault that the collocator's cable
5 occupies. This was calculated based on the diameter of the collocator's cable. The
6 calculation takes into account the unistrut racking for holding the cable and splice
7 closures. This area is then used to calculate the amount of unistrut racking space the
8 cable will occupy on a cubic foot basis. The Cable Vault Utilization calculation is on
9 page 65 in Section 6 of the EIS Study.

10
11 **Cable Rack Utilization**

12 **Q. WHAT ARE THE ACTIVITIES AND COSTS ASSOCIATED WITH THE**
13 **COLLOCATOR'S USE OF THE CABLE RACK?**

14 **A.** Costs for Cable Rack Utilization are the costs for the area that will be occupied by a
15 collocator's cable when run through a central office superstructure to the MDF or DS-X
16 panel, or to the collocation space of another collocator. The cable rack utilization cost
17 was developed based on a quantity of cables that could be placed on a 24-inch cable rack.
18 Verizon's Network Design engineering group provided the estimate of cables that could
19 occupy the 24-inch cable rack. Cable diameters and the diameter of innerduct housing
20 fiber cable, were used to determine the amount of space occupied by the cable on a foot
21 length of cable rack. The development of these costs may be found on pages 66 - 67 of
22 Section 6 of the EIS Study.

1 **Fiber Optic Cross Connect**

2 Q. WHAT ARE THE ACTIVITIES AND COSTS ASSOCIATED WITH THE FIBER
3 OPTIC DUCT SYSTEM?

4 A. The costs associated with the fiber optic duct system are the material, engineering and
5 installation of the trays and associated materials to create a path to hold the fiber optic
6 patch cords to reach the fiber distribution panel. This cost is then used to determine a
7 cost per patch cord. These costs are provided on pages 73 – 74 of Section 6 of the EIS
8 Study.

9

10 Q. ARE THERE OTHER COSTS ASSOCIATED WITH THE FIBER OPTIC CROSS
11 CONNECT?

12 A. Yes. There are costs for the fiber distribution panel and relay rack, as well as the labor
13 associated with the engineering and installation of the fiber distribution panel and the
14 relay rack. These costs are taken from GTEAMS and then calculated to a cost-per-
15 connection. There also are floor space costs associated with the fiber distribution panel,
16 which are calculated to a connection on the fiber distribution panel. These costs are
17 provided on pages 70 – 72 of the EIS Study.

18

19 **Building Integrated Timing Supply (BITS)**

20 Q. WHAT BITS COSTS WILL BE RECOVERED THROUGH A MONTHLY
21 RECURRING CHARGE AND HOW WERE THE COSTS CALCULATED?

22 A. These BITS costs are the total material and labor (engineering and installation) costs for
23 establishing BITS within a central office, based on a system (Telcom Solutions DCD-

1 519/2Ew/GPS) used by Verizon in its installation. Costs for common control equipment
2 and associated port cards are included, and appropriate material loading is applied on the
3 equipment investment. These costs are provided on pages 68 - 69 of Section 6 of the EIS
4 Study.

5
6 **IV. SUMMARY**

7
8 **Q. PLEASE PROVIDE A SUMMARY OF YOUR TESTIMONY.**

9 A. My testimony addressed the inputs and technical aspects of the Verizon EIS Collocation
10 Cost Study. I explained the cost elements and the composition of the study. The costs
11 result from examining the costs incurred in the provisioning of collocation.

12
13 **Q. DOES THIS CONCLUDE YOUR TESTIMONY?**

14 A. Yes.

ATTACHMENT/EXHIBIT

ITEM TOO LARGE TO SCAN

COPY AVAILABLE IN CHIEF CLERK'S OFFICE